Level of Knowledge of the Nurses Work in a Public Hospital about the Prevention of Catheter Associated Urinary Tract Infections

Yildiz Kose[1], Yeliz Leblebici[1], Selma Sen Akdere[2], Hatice Cakmakci[1], Serap Otunctemur[1], Memet Taskin Egici[3], Guven Bektemur[3]

ABSTRACT:

Level of knowledge of the nurses work in a public hospital about the prevention of catheter associated urinary tract infections

Objective: To evaluate the level of knowledge of the nurses in Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, about the use of a urinary catheter to prevent urinary tract infections.

Materials and Method: A descriptive research was held in 82% of a total of 469 nurses, 111 of whom work in intensive care unit, and 271 work in the clinics and a survey was performed. Data was collected by using a five-point Likert type survey which was prepared to show demographic features and level of knowledge. The numerical values, percentages and the arithmetic mean were evalueted with One-way Anova and Kruskal-Wallis tests.

Results: The level of knowledge of nurses who have associate degree, older than 30 years, woman in gender, and have duration of professional experience of 11-15 years were found to be higher, compared to the others in prevention of catheter-associated urinary tract infections. ICU nurses have inadequate knowledge about necessary points to put urinary catheter and what they should pay attention to care of patients who have a cathateter but; they have sufficient info about procedure to putting the catheter.

Conclusion: The study showed that the education level, age, gender and experience of nurses affect their status of knowledge of preventing catheter-associated urinary tract infections. It was detected that the nurses didnt receive adequate training on catheter-associated urinary tract infections. They were detected to have sufficient information on how to insert a urinary catheter, but not enough information on catheter care, use of urine bags and the intidactions of urinary catheterization.

Keywords: Infection prevention, nursing interventions, urinary tract infection

ÖZET:

Bir kamu hastanesinde çalışan hemşirelerin kateter ilişkili üriner sistem enfeksiyonlarının önlenmesi hakkındaki bilgi durumları

Amaç: Araştırma, İstanbul Şişli Hamidiye Etfal Eğitim ve Araştırma Hastanesi'nde çalışan hemşirelerin, üriner sistem enfeksiyonlarını önlemek üzere üriner kateter kullanımına ilişkin bilgi durumlarını değerlendirmek amacıyla yapılmıştır.

Gereç ve Yöntem: Hastanede çalışan toplam 469 hemşirenin 111'i yoğun bakım, 271'i klinik hemşiresi olmak üzere %82'sine tanımlayıcı nitelikte anket uygulanmıştır. Veriler, hemşirelerin demografik özelliklerini, bilgi durumlarını belirlemeye yönelik 5 puanlı likert türünde hazırlanmış anket formu ile toplanmış, sayı, yüzde, aritmetik ortalama, tek yönlü Anova ve Kruskal Wallis testleri kullanılarak değerlendirilmiştir.

Bulgular: Ön lisans düzeyinde eğitim seviyesinde, 30 yaş üstünde, bayan, mesleki deneyimi 11-15 yaş arasında olan hemşirelerin katater ile ilişkili üriner sistem enfeksiyonlarının önlenmesinde bilgi durumlarının diğer gruplara göre yüksek olduğu saptanmıştır. Yoğun bakım hemşirelerinin üriner kateterizasyonun endikasyonları ve kateteri olan hastada dikkat edilecek genel noktalar konusunda yeterli bilgiye sahip olmadıkları, üriner kateteri yerleştirme sırasındaki uygulamalara ilişkin bilgi durumlarının da yeterli olduğu belirlenmiştir.

Sonuç: Araştırma, hemşirelerin eğitim durumunun, yaşının, cinsiyetinin ve mesleki deneyim sürelerinin kateter ile ilişkili üriner sistem enfeksiyonları önleme konusundaki bilgi durumlarını etkilediğini göstermiştir. Hemşirelerin kateter ilişkili üriner sistem enfeksiyonları hakkında yeterli eğitim almadıkları saptanmıştır. Üriner kateteri yerleştirme sırasındaki uygulamalara ilişkin bilgi durumlarının yeterli olduğu fakat kateter bakımı, idrar torbası kullanımı ve üriner kateterizasyonun endikasyonları konusunda yeterli bilgiye sahip olmadıkları saptanmıştır.

Anahtar kelimeler: Enfeksiyonları önleme, hemşirelik girişimleri, üriner sistem infeksiyonu

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[1]Sisli Hamidiye Etfal Traning and Research Hospital, Health Care Services Directorate, Istanbul - Turkey
[2]Sisli Hamidiye Etfal Traning and Research Hospital, Infection Control Committee, Istanbul - Turkey
[3]Istanbul Beyoglu Public Hospitals Association of General Secretariat, Istanbul - Turkey

Address reprint requests to / Yazışma Adresi:
Yıldız Kose,
Sisli Hamidiye Etfal Traning and Research Hospital, Health Care Services Directorate, Istanbul - Turkey

Phone / Telefon: +90-212-373-5346

E-mail / E-posta:
yzkose@gmail.com

INTRODUCTION

Urinary catheter was used in patients at a rate of 79% in the intensive care units of İstanbul Şişli Hamidiye Etfal Training and Research Hospital in 2014, while this rate was found to be 74% in 2015 (9-month average). Due to widespread use, especially in intensive care unit (ICU) patients, the urinary tract infections are reported to be among the most common nosocomial infections (30-40%), and the cause of 80% of urinary tract infections are reported to be urinary catheterization (1). In a multicenter study of Leblebicioğlu et al. (2), it is stated that also in our country, 65% of urinary tract infections are associated with catheter. Urinary tract infections play an important role in stay in hospital in ICU patients (3) and in increase in mortality (4,5).

The more common use of urinary catheters in ICUs compared to the other services, the longer period of staying of these catheters in patients, and causing morbidity and mortality in these patients require a more serious care and brings important responsibilites to ICU nurses.

In the literature, it is noted that the ICU nurses have responsibilites about the avoidance of unnecessary catheter insertions, attention to aseptic technique of urinary catheterization, maintenance of closed drainage system in patients with inserted urinary catheters, durarion of catheterization, the level of the drainage bags, the applications of emptying the bags, and the diligence of meatus hygiene (6). Therefore, the ICU nurses should have current knowledge about the prevention of urinary infections and should continue to perform effective care for their patients, using their knowledge (7).

The aim of this study was to evaluate the status of knowledge of the nurses of İstanbul Şişli Hamidiye Etfal Training and Research Hospital on urinary catheter use to prevent urinary tract infections.

MATERIAL AND METHOD

This descriptive study both for its population and the sampling constituted 382 nurses out of 510 who work at the hospital. A survey was conducted with 111 out of 130 ICU nurses. Because 10 ICU nurses didn't agree to participate in the study, and 9 ICY nurses inadequately completed the survey, they were excluded from the study.

Data Collection

For data collection, a survey was used to detect the level of knowledge demographic characteristics of the nurses, and their level of knowledge about the indications for use of urinary catheter, the insertion and the use of urinary catheter, which they can answer in 5-6 minutes. In the survey form, the questions that assess the state of their knowledge about preventing urinary infections were prepared in 5-point Likert type (1, i don't know; 2, never; 3, sometimes; 4, generally; 5, always). A total of 30 questions were applied, and in the questions (7th, 9th and 10th questions) that define the general measures in the section of knowledge level concerning the catheter, reverse rating in itself were given place. For example, while the appropriate score is 5 for the statement "if the meatus is dirty, the zone is cleaned with water and soap", for the other 2 questions, the appropriate score was defined as 2.

Data Analysis

In evaluating the data obtained in the study, IBM SPSS Statistics 22 (IBM SPSS, Turkey) program was used for the statistical analysis. The compliance of the parameters to the distribution of the normal was evaluaed with Shapiro–Wilk test when the study data was being evaluated it was detected that the parameters didn't show a normal distribution. While the study data was being analyzed, beside the descriptive statistical methods (frequency), the comparison of the quantitative data and the inter-group parameter comparisons were performed with Kruskal-Wallis test and at the detection of the group that causes the difference, Mann-Whitney U test was used. Mann-Whitney U test was used for the inter-group comparison of the parameters. p<0.05 was considered statistically significant.

Table-1: The distribution of the descriptive characteristics of the nurses

	n	%
Education		
Highschool	64	16.8
Associate degree	64	16.8
Undergraduate	221	57.9
Masters and higher	33	8.6
Work place		
ICU	111	29.1
Clinics	271	70.9
ICU (n=111)		
Adult	41	36.9
Pediatric	18	16.2
Newborn	22	19.8
Brain surgery	10	9.0
Coronary	14	12.6
Neurology	6	5.4
Clinic (n=271)		
Internal medicine	74	27.3
Surgery	67	24.7
Pediatric	38	14.0
Gynecology	33	12.2
Emergency	59	21.8
Age		
18-25	123	32.2
26-30	107	28.0
31-35	70	18.3
36-45	82	21.5
Gender		
Female	312	81.7
Male	70	18.3
Duration of Professional Experience		
<1	35	9.2
1-5	160	41.9
6-10	72	18.8
11-15	35	9.2
16-20	30	7.9
≥20	50	13.1
Training About Catheter-Associated Urinary Tract Infections		
Yes	203	53.1
No	179	46.9

RESULTS

Of the nurses, 81.7% was female, 57.9% had university degree, 70.9% worked in the clinics, 29.1% worked in ICUs, 41.9% worked as a nurse between 1-5 years and 53.2% had a training of infection related with the catheter (The distribution of the descriptive feautres of the nurses were shown in Table-1).

The distribution of the answers to questions concerning the knowledge level of insertion of catheter of the nurses and the minimum, maximum, mean and standard deviation values obtained, were shown in Table-2. The score for the level of knowledge for insertion of catheter of the nurses ranged from 1 to 5, with a mean value of 4.80±0.54. It is detected that the level of knowledge of the nurses concerning the intervention during the catheter insertion, to prevent the urinary tract infections was adequate.

The distribution of the answers to questions concerning the knowledge level of catheter care of the nurses and the minimum, maximum, mean and standard deviation values obtained, were shown in Table-3. The score for the level of knowledge for catheter care of the nurses ranged from 1 to 5, with a mean value of 3.86±0.97. It was detected that the nurses couldn't get enough scores from the questions of daily catheter care, cleaning with antiseptics in case of dirt in the meatus, and the cleaning of the zone with water and soap even if there is no dirt at the meatus. Of the other applications to do, they were detected to have

Table-2: The Distribution Of The Answers To The Questions Related With The Knowledge Level Of The Nurses About The Insertion Of The Catheters, and Obtained Minimum, Maximum, Mean and Standard Deviation Score Levels

	Min-Max			Mean±SS	
The Knowledge Level Of Catheter Insertion	1-5			4.80±0.54	
QUESTIONS	**I Don't Know n (%)**	**Never n (%)**	**Sometimes n (%)**	**Generally n (%)**	**Always n (%)**
1 Hands Are Washed Before and After The Catheter Related Procedures	6 (%1.6)	3 (%0.8)	7 (%1.8)	29 (%7.6)	337 (%88.2)
2 Sterile Gloves Are Used When Inserting The Catheter	6 (%1.6)	1 (%0.3)	5 (%1.3)	17 (%4.5)	353 (%92.4)
3 The Catheter Is Inserted With The Aseptic Technique	17 (%4.5)	11 (%2.9)	4 (%1.0)	20 (%5.2)	330 (%86.4)
4 Sterile Material Is Used When Inserting The Catheter	10 (%2.6)	2 (%0.5)	4 (%1.0)	7 (%1.8)	359 (%94.0)
5 Periurethral Region Is Cleaned With Povidone Iodine	7 (%1.8)	3 (%0.8)	10 (%2.6)	18 (%4.7)	344 (%90.1)
6 Appropriate Size Of Catheter Is Used	5 (%1.3)	2 (%0.5)	8 (%2.1)	30 (%7.9)	337 (%88.2)

Table-3: The Distribution Of The Answers To The Questions Related With The Knowledge Level Of The Nurses About The Catheter Care, and Obtained Minimum, Maximum, Mean and Standard Deviation Score Levels

		Min-Max		Mean±SS	
The Knowledge Level Of Catheter Care		1-5		3.86±0.97	
QUESTIONS	I Don't Know n (%)	Never n (%)	Sometimes n (%)	Generally n (%)	Always n (%)
7 Daily Catheter Care Is Performed	22 (%5.8)	18 (%4.7)	54 (%14.1)	72 (%18.8)	216 (%56.5)
8 Meatus Is Cleaned With Water And Soap If There Is Dirt	42 (%11.0)	49 (%12.8)	38 (%9.9)	63 (%16.5)	190 (%49.7)
9 Meatus Is Cleaned Antiseptic Solution If There Is Dirt	33 (%8.6)	34 (%8.9)	48 (%12.6)	65 (%17.0)	202 (%52.9)
10 Meatus Is Cleaned With Water And Soap Even If There Is No dirt	46 (%12.0)	66 (%17.3)	63 (%16.5)	58 (%15.2)	149 (%39.0)

Table-4: The Distribution Of The Answers To The Questions Related With The Knowledge Level Of The Nurses About The Use Of Drainage Bags, and Obtained Minimum, Maximum, Mean and Standard Deviation Score Levels

		Min-Max		Mean±SS	
The Knowledge Level Of Use Of Drainage Bags		1-5		3.78±0.61	
QUESTIONS	I Don't Know n (%)	Never n (%)	Sometimes n (%)	Generally n (%)	Always n (%)
11 The Bag Is Emptied Before The Patient Transfer	17 (%4.5)	6 (%1.6)	19 (%5.0)	56 (%14.7)	284 (%74.3)
12 The Bag Is Unchanged Unless There Is Damage, Leakage, Sediment Collection or Smell	27 (%7.1)	90 (%23.6)	51 (%13.4)	75 (%19.6)	139 (%36.4)
13 The Bag Is Changed Weekly	54 (%14.1)	84 (%22.0)	68 (%17.8)	75 (%19.6)	101 (%26.4)
14 The Connection Site Is Cleaned With Alcohol 70% Or Povidone Iodine Before Inserting A New Bag	35 (%9.2)	26 (%6.8)	29 (%7.6)	56 (%14.7)	236 (%61.8)
15 The Bag Is Changed Before Its 2/3 Is Full	31 (%8.1)	39 (%10.2)	52 (%13.6)	86 (%22.5)	174 (%45.5)
16 Antiseptic Solution Is Put In The Drainage Bag	119 (%31.2)	191 (%50.0)	14 (%3.7)	21 (%5.5)	37 (%9.7)
17 When Emptying The Bag, Care Is Taken To Not To Seperate It From The System, And Empty It From The Tap Below	13 (%3.4)	5 (%1.3)	8 (%2.1)	51 (%13.4)	305 (%79.8)
18 A Seperate Container Is Used For Each Patient	24 (%6.3)	38 (%9.9)	27 (%7.1)	42 (%11.0)	251 (%65.7)

inadequate information with a score below the average value 4. These questions related with urinary catheter care, should be answered with "never", which is equal to score "2".

The distribution of the answers to questions concerning the use of drainage bag of the nurses and the minimum, maximum, mean and standard deviation values obtained, were shown in Table-4. The nurses are detected to have inadequate scores about the emptying of the bag before transfer, the weekly changing of the drainage bag, not to seperate it from the system while emptying it, diligence to empty it from the bottom tap, and putting antiseptic solution in the bag. They were detected to have insufficient information about the other interventions, with a mean score below 4.

The distribution of the answers of the nurses to questions concerning the urinary catheterization and the minimum, maximum, mean and standard deviation values obtained, were shown in Table-5. The score for the level of knowledge for urinary catheterization of the nurses ranged from 1 to 5, with a mean value of 3.82±0.69'dur. The nurses were detected to have insufficient information concerning the maintenance of the closed drainage system in catheter insertion, irrigation if the catheter is clogged, keeping the catheter below the level of bladder, maintenance of the closed system during taking cultures and preventing the contact of drainage system with floor, with their mean scores below 4.

The evaluation of the scores of the nurses according to their education level is given in Table-6. There is statistically significant difference between

Table-5: The Distribution Of The Answers To The Questions Related With The Knowledge Level Of The Nurses About The Urinary Catheterization, and Obtained Minimum, Maximum, Mean and Standard Deviation Score Levels

	Min-Max			Mean±SS	
The Knowledge Level Of Use Of Urinary Catheterization	1-5			3.82±0.69	
QUESTIONS	I Don't Know n (%)	Never n (%)	Sometimes n (%)	Generally n (%)	Always n (%)
19 Closed Drainage System Is Maintained In Catheter Insertıon	46 (%12.0)	5 (%1.3)	21 (%5.5)	57 (%14.9)	253 (%66.2)
20 The Connection Site Is Disinfected Before The Drainage System Is Disconnected	41 (%10.7)	20 (%5.2)	33 (%8.6)	71 (%18.6)	217 (%56.8)
21 Irrigation Is Performed If The Catheter Is Clogged	26 (%6.8)	11 (%2.9)	38 (%9.9)	64 (%16.8)	243 (%63.6)
22 Antimicrobial Agents Are Used When Irrigating	87 (%22.8)	83 (%21.7)	50 (%13.1)	34 (%8.9)	128 (%33.5)
23 The Connection Sites Are Closed Before Patient Transfer	36 (%9.4)	33 (%8.6)	28 (%7.3)	58 (%15.2	227 (%59.4)
24 The Catheter Is Changed Only If It Is Clogged	54 (%14.1)	103 (%27.0)	53 (%13.9)	50 (%13.1)	122 (%31.9)
25 The Catheter Is Kept Under The Level Of Bladder	19 (%5.0)	14 (%3.7)	20 (%5.2)	29 (%7.6)	300 (%78.5)
26 Catheter Is Changed Every 7 Days	79 (%20.7)	88 (%23.0)	57 (%14.9)	60 (%15.7)	98 (%25.7)
27 Regular Culture Is Taken From The Catheter	71 (%18.6)	61 (%16.0)	104 (%27.2)	57 (%14.9)	89 (%23.3)
28 While Taking Culture/Sample The System Is Seperated And The Urine Flow Is Provided Into A Syringe	67 (%17.5)	102 (%26.7)	34 (%8.9)	57 (%14.9)	122 (%31.9)
29 Care Is Taken To Maintain The Closed System To Take Sample/Culture	23 (%6.0)	8 (%2.1)	19 (%5.0)	60 (%15.7)	272 (%71.2)
30 The Contact Of The Drainage System To The Ground Is Avoided	13 (%3.4)	3 (%0.8)	11 (%2.9)	39 (%10.2)	316 (%82.7)

Table-6: The Evaluation Of The Scores According To The Education Level

Eğitim Durumu	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
Highschool	4.78±0.6 (5)	3.98±1.0 (4)	3.77±0.7 (3.75)	3.76±0.86 (3.75)
Associate degree	4.81±0.57 (5)	4.16±0.98 (4.5)	3.93±0.54 (4)	3.98±0.67 (4)
Undergraduate	4.79±0.54 (5)	3.77±0.95 (3.75)	3.75±0.61 (3.88)	3.81±0.64 (3.83)
Master and higher	4.88±0.23 (5)	3.71±0.89 (3.75)	3.77±0.6 (3.88)	3.67±0.58 (3.75)
p	0.664	0.004**	0.154	0.095

Kruskal-Wallis Test, **p<0.01

the mean scores of the level of knowledge of catheter care of the nurses according to their education level (p:0.004; p<0.01). As a result of the pairwise comparisons to determine the education level, of which the significance is derived from, the mean scores of the level of knowledge about the catheter care of the nurses with the associate degree, were significantly higher than the nurses with undergraduate degree and with master degree or above (p1:0.001, p2:0.006; p<0.01). There is no statistically significant difference between the mean scores of level of knowledge of the nurses with other degrees of education, concerning the catheter care (p>0.05).

The evaluation of the scores of the nurses according to their age is given in Table-7. There is statistically significant difference among the age groups, between the mean level of knowledge of the nurses concerning the use of drainage bags (p:0.041; p<0.05). As a result of pairwise comparison to detect which age group affects the significance, nurses in the age group of 18-25 years have significantly lower mean level of knowledge concerning the use of drainage bags, than the nurses in the age groups of 26-30 years, 31-35 years and 36-45 years (p1:0.038, p2:0.011; p3:0.045; p<0.05). There is statistically significantly no difference in the mean level of knowledge of the nurses between the age groups

Table-7: The Evaluation Of The Scores According To The Age

Age	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
18-25	4.78±0.53 (5)	3.77±0.93 (3.75)	3.69±0.58 (3.75)	3.77±0.68 (3.75)
26-30	4.82±0.48 (5)	3.82±1.04 (4)	3.79±0.64 (3.88)	3.75±0.71 (3.75)
31-35	4.83±0.45 (5)	3.83±0.95 (4)	3.89±0.54 (4)	3.9±0.6 (4)
36-45	4.77±0.67 (5)	4.09±0.93 (4.25)	3.83±0.66 (3.88)	3.91±0.72 (4)
p	0.879	0.061	0.041*	0.240

Kruskal-Wallis Test, *p<0.05

Table-8: The Evaluation Of The Scores According To The Gender

Gender	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
Female	4.82±0.48 (5)	3.85±0.95 (4)	3.77±0.61 (3.88)	3.8±0.7 (3.83)
Male	4.68±0.74 (5)	3.92±1.05 (4.25)	3.84±0.62 (4)	3.91±0.63 (3.88)
p	0.022*	0.360	0.179	0.324

Mann Whitney U Test, *p<0.05

Table-9: The Evaluation Of The Scores According To The Duration Of Professional Experience

Duration Of Professional Experience (Years)	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
<1	4.71±0.67 (5)	3.76±1.03 (3.75)	3.59±0.66 (3.75)	3.74±0.72 (3.75)
1-5	4.81±0.41 (5)	3.73±1.01 (3.75)	3.74±0.59 (3.75)	3.75±0.70 (3.75)
6-10	4.85±0.50 (5)	3.84±0.92 (3.88)	3.86±0.55 (4)	3.84±0.62 (3.83)
11-15	4.86±0.27 (5)	4.18±0.77 (4.25)	3.85±0.58 (3.88)	4.07±0.64 (4.08)
16-20	4.83±0.62 (5)	4.07±0.83 (4.13)	3.85±0.65 (3.94)	3.79±0.63 (3.92)
≥20	4.67±0.83 (5)	4.07±1.02 (4.38)	3.87±0.71 (4)	3.91±0.74 (4)
p	0.702	0.060	0.069	0.162

Kruskal-Wallis Test

26-30 years, 31-35 years and 36-45 years concerning the use of drainage bags (p>0.05).

The evaluation of the scores of the nurses by gender is shown in Table-8. The mean value of level of knowledge concerning the catheter insertion of male nurses is signficiantly lower than the female nurses (p:0.022; p<0.05).

The evaluation of the scores of the nurses by the duration of professional experience is shown in Table-9. There is statistically no significant difference between the mean values of level of knowledge concerning the insertion of catheter, the catheter care, the use of drainage bags, and urinary catheterization, by the duration of professional experience of the nurses (p>0.05). The evaluation of the scores of the nurses concerning their training about the catheter-associated urinary tract infections is shown in Table-10. There was statistically no significant difference between the mean level of knowledge scores of the nurses concerning the

Table-10: The Evaluation Of The Scores According To The Training Status About Catheter-Associated Urinary Tract Infections

Training About The Catheter-Associated Urinary Tract Infections	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
Yes	4.8±0.59 (5)	3.87±0.95 (4)	3.82±0.56 (3.88)	3.90±0.59 (3.92)
No	4.8±0.47 (5)	3.85±0.99 (4)	3.74±0.67 (3.88)	3.73±0.77 (3.75)
p	0.064	0.936	0.422	0.047*

Mann Whitney U Test, *p<0.05

Table-11: The Evaluation Of The Scores According To The Unit They Work

The Work Unit	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
ICU	4.87±0.33 (5)	4.07±0.89 (4.3)	3.87±0.57 (3.9)	3.95±0.56 (3.9)
Clinics	4.77±0.60 (5)	3.78±0.99 (3.8)	3.75±0.63 (3.9)	3.76±0.73 (3.8)
p	0.140	0.006**	0.249	0.091

Mann Whitney U Test, *p<0.05

Table-12: The Evaluation Of The Scores According To The ICU They Work

ICU	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
Adult	4.85±0.26 (5)	4.15±0.82 (4.3)	3.69±0.57 (3.6)	3.87±0.47 (3.8)
Pediatric	4.91±0.22 (5)	4.29±0.98 (4.5)	3.86±0.71 (4)	3.88±0.5 (3.8)
Newborn	4.89±0.28 (5)	4.02±0.79 (4)	4.07±0.48 (4)	4.15±0.73 (4.3)
Brain surgery	4.72±0.84 (5)	4.30±0.73 (4.4)	4.04±0.39 (3.9)	3.90±0.48 (3.9)
Coronary	4.93±0.14 (5)	3.34±0.96 (3.5)	3.81±0.53 (3.9)	3.89±0.53 (3.7)
Neurology	5.00±0.00 (5)	4.46±0.78 (4.8)	4.23±0.46 (4.4)	4.22±0.68 (4.1)
p	0.509	0.029*	0.045*	0.545

Kruskal-Wallis Test, *p<0.05

insertion of catheter, catheter care, and the use of drainage bag, and their training about the catheter-associated urinary tract infections (p>0.05). The nurses who had training about catheter-associated urinary tract infections have significantly higher mean values of level of knowledge about the urinary catheterization, than the ones who were nor trained (p:0.047; p<0.05).

The evaluation of the scores of the nurses by the unit they work is shown in Table-11. There was statistically no significant difference between the mean level of knowledge scores of the nurses concerning the insertion of catheter, the use of drainage bag and urinary catheterization, and the unit they work (p>0.05). The mean level of knowledge about the catheter care of the ICU nurses was significantly higher than the nurses working in clinics (p:0.006; p<0.01).

The evaluation of the scores of the nurses by the ICU they work is shown in Table-12. There is statistically no significant difference between the mean level of knowledge scores of the nurses concerning the insertion of catheter and urinary catheterization, and the ICU they work (p>0.05).

Table-13: The Evaluation Of The Scores According To The Clinic They Work

Clinic	The Knowledge Level of Catheter Insertion	The Knowledge Level of Catheter Bilgi Care	The Knowledge Level of Use Of Drainage Bags	The Knowledge Level of Use Of Urinary Catheterization
	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)	Mean±SS (median)
Internal medicine	4.84±0.29 (5)	3.89±0.86 (4)	3.81±0.57 (3.9)	3.90±0.61 (4)
Surgery	4.71±0.62 (5)	3.65±0.89 (3.8)	3.76±0.56 (3.9)	3.78±0.73 (3.9)
Pediatric	4.86±0.32 (5)	3.45±0.93 (3.5)	3.67±0.56 (3.8)	3.62±0.75 (3.7)
Gynecology	4.83±0.7 (5)	3.73±1.10 (3.5)	3.61±0.71 (3.6)	3.69±1.00 (3.8)
Emergency	4.64±0.87 (5)	4.02±1.16 (4.5)	3.78±0.75 (4)	3.70±0.66 (3.7)
p	0.405	0.007**	0.250	0.221

Kruskal-Wallis Test, **p<0.01

There is statistically significant difference between the mean level of knowledge of the nurses about catheter care, and the ICU they work (p:0.029; p<0.05). As a result of the pairwise comparisons to determine the ICU, of which the significance is derived from, the mean scores of the level of knowledge about the catheter care of the nurses that work in coronary ICU, were significantly lower than the nurses that work in the adult, pediatric, newborn, brain surgery and neurology ICUs. (p1:0.008; p2:0.003; p3:0.045, p4:0.019; p5:0.020; p<0.01; p<0.05). No significant difference was detected between the mean scores of level of knowledge about the catheter care of the adult, pediatric, newborn, brain surgery and neurology ICU nurses (p>0.05). There is statistically significant difference between the mean scores of level of knowledge about the use of drainage bag, by the ICU that the nurses work (p:0.045; p<0.05). As a result of the pairwise comparisons to determine the ICU, of which the significance is derived from, the mean scores of the level of knowledge about the use of drainage bags of the nurses that work in adult ICU, were significantly lower than the nurses that work in the newborn, brain surgery and neurology ICUs (p1:0.007; p2:0.042; p3:0.029; p<0.01; p<0.05). No significant difference was detected between the mean scores of level of knowledge about the catheter care of the nurses that work in the other ICUs (p>0.05).

The evaluation of the scores of the nurses by the clinic they work is shown in Table-13. There is statistically no significant difference between the mean scores of level of knowledge of the nurses about the insertion of catheter, the use of drainage bags, and the urinary catheterization by the clinic they work (p>0.05). There is statistically significant difference between the mean scores of level of knowledge of the nurses about the catheter care, by the clinic they work (p:0.007; p<0.01). As a result of the pairwise comparisons to determine the clinic, of which the significance is derived from, the mean scores of the level of knowledge about the catheter care of the nurses that work in pediatric ICU, were significantly lower than the nurses that work in the internal medicine and the emergency clinics (p1:0.019; p2:0.001; p<0.05; p<0.01). The scores of the nurses that work in the surgery clinics were found to be significantly lower than the nurses that work in emergency clinic (p:0.006; p<0.01). No significant difference was detected between the mean scores of level of knowledge about the catheter care of the nurses that work in the other clinics (p>0.05).

DISCUSSION

In the studies, the urinary tract infections that were reported to range between 20-65% in our countyry are seen as a major problem in the ICUs. In the literature , it is detected that there are many studies on the effect of catheter types and the catheter indications on infections, that are used to prevent urinary tract infections which is a major problem for the hospitals, however, studies that research the knowledge, attitude and behaviours of the nurses

towards preventing the infections associated with urinary catheters are detected to be very few. This study will shed a light to measures to be taken in applications of the ICU nurses that would prevent urinary catheter-related infections.

In this study, it was detected that the nurses received adeqaute scores in the level of knowledge about the insertion of the catheter, but not received the expected scores in the level of knowledge about the catheter care, the use of drainage bags and the urinary catheterization. In the study conducted by Drekonja et al. (8), supporting our study results, they reported that the nurses didn't have sufficient information about the indications for urinary catheter use.

The ICU nurses were seen to have sufficient knowledge on applications to be needed to pay attention during insertion of urinary catheter. No statistically significant difference was detected between the nurses that were trained about the infections and that were not trained. The nurses who were trained about infections, getting th same score with the untrained ones, show that the given education is not sufficient for the nurses. In the study, it is detected that the nurses didn't have enough information on the applications to be used in patients with urinary catheters. Aytaç et al.'s (9) study reported that the 47.6% of the nurses had accurate information on daily catheter care. The half of the ICU nurses notifying that using antiseptic solution if there is dirt at meatus or meatus care should be made with water and soap, and having no expected mean scores of knowledge on this application, indicates that the nurses have inadequate information on this subject. Tsuchida et al. (10) in their study, stated that the daily perineal region care reduced the catheter-related urinary tract infections by 20%, and indicated the importance of the regional cleaning with water and soap, especially in patients with fecal incontinence. Kosgeroğlu et al. (11) in their study stated that there is no effect of antiseptic solution use in meatus care on reducing the rates of infection. Gould et al. (12) and Hooton et al.'s (13) guidelines for preventing the urinary infections, also states that the routine meatus care and use of antiseptic solutions for this

aim do not have a place to prevent the infections. In this study, it is detected that the ICU nurses have insufficient information on applications of use of drainage bags, the changing of the drainage bags and to use a seperate container for each patient. In the literature, it is reported that it is crucial to use seperate containers for each patient, the avoidance of making a routine change unless there is damage, leakage, sediment collection or smell at the drainage bags, and to disinfect the entrance area before inserting a new drainage bag (14). It is detected that the nurses have inadeqaute information on maintaining the closed drainage system in catheter insertion, irrigating if the catheter is clogged, keeping the catheter under the level of bladder, maintaining the closed system when taking cultures and preventing the contact of the drainage system with the floor, with getting a mean score below 4. In the literature, in the guideline for prevention of urinary tract infections, it is recommended to not to irrigate the catheter unless there is no clogging, to maintain the closed drainage system, to avoid the contact of the drainage system with the floor, to keep the catheter below the level of the bladder, to close the connection sites of the catheter before the patient transfer, and to disinfect the connection sites before disconnecting the drainage system. Again in the same paper, it is emphasized to avoid the routine catheter exchange, and regular culture taking from the catheter (15).

CONCLUSION

As a result, nearly half of the patients were found to not to have an education on "Catheter-Associated Urinary Tract Infections", not to have adequate knowledge about catheter care, use of drainage bags and indications of urinary catheterization, but having sufficient information on applications during the insertion of urinary catheters. The ICU nurses were detected to have bettwe knowledge scores than the nurses that work in the clinics.

In line with these results,

➢ It may be recommended for the nurses that work in the clinics to be trained continuously in their institutions for urinary infections, frequent

repetition of their training, performing pre-tests and post-tests in their training and encouraging them to join certification programs for infection control nursing.

➤ It may be recommended to nurses that work in the clinics to follow the meetings and the publications tin order to learn the current approaches about the subject.

➤ It may be recommended to establish written protocols in the institutions, related to the patient care with urinary catheter, and supervising the compliance of the nurses to these protocols.

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